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Preliminary Report

MOSQUITO COVE - BULL ARM AREA, TRINITY BAY: AGGREGATE POTENTIAL FOR OFFSHORE CONSTRUCTION MATERIALS

by

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INTRODUCTION

The Bull Arm - Mosquito Cove area is situated on the east coast of Newfoundland in Trinity Bay. The numerous coves in the area are uninhabited, the nearest community, Sunnyside, is situated at the mouth of Arm, which has a population of about 500 people. The area was surveyed between May 28, and June 25, 1990 to identify potential bedrock-aggregate sites for possible use in the construction of concrete platforms. The present field work is a follow-up of a reconnaissance survey, done in Oct. 1989 to the immediate area of Mosquito Cove; this preliminary report combines the results of both field surveys.

GENERAL GEOLOGY

The general geology (Figure 1) of the area consists of Cambrian volcanic and sedimentary rocks of the Bull Arm Formation of the Musgravetown Group.

The volcanic rocks of the area consists of felsic - mafic flows of basalt, andesite and rhyolite, and pyroclastics (mafic and felsic tuffs) of the Bull Arm Formation.

The sedimentary rock of the area consists of sandstones, siltstones and conglomerates of the Big Head, Crown Hill, Maturin Ponds and Trinny Cove formations.

The volcanic and sedimentary rocks of the area are mainly fresh with minor surface weathering, however weathering may range locally from slight to moderate. The rocks are also slightly to moderately altered.

SITE LOCATIONS

A total of 57 sites (Figure 2) were examined during the field investigation and 52 samples were collected for further analysis.

Below is a brief description of each site visited:

90-001: Coastal outcrop approximately 1km south of Stock Cove, Bull Arm. The rock type present is a tan coloured crystal lithic tuff, which is fresh, hard and competent. The rock varies from massive to highly jointed. (from 10cm to 1m density). The bedrock at this site should pass all the physical test requirements; a large sample, 35kg was taken from this site for Alkali-reactivity testing.

90-002: Coastal outcrop 0.5km. south of Stock Cove, Bull Arm. The rock type at this site is a pinkish-reddish lithic tuff.

The outcrop seems to be more foliated and weathered (surface weathering) at this site than at site 001. Diabase dykes are also present and the outcrop is highly fractured.

90-003: Small coastal outcrop (8 m long) at the mouth of Stock Cove. The rock type is a reddish lithic tuff similar to that at site 002.

90-004: Coastal outcrop at the mouth of Stock Cove. At this site there are two distinct rock types: lithic tuff and crystal tuff.

90-005: Coastal outcrop at the head of Stock Cove. Massive, fresh, hard and competent flow-banding rhyolite near the contact of lithic tuff. There are numerous fractures in the outcrop. A large sample was collected for alkali-aggregate reaction testing (A.A.R.).

90-006: Coastal outcrop 1km north of Stock Cove. Rock type is similar to site 005 except for basaltic dykes intruding the rhyolite. The basalt is fresh, hard and brecciated locally; associated with chlorite veinlets.

90-007: Coastal outcrop 1.6km north of Stock Cove. Massive, fresh, hard basalt having chlorite veins similar to the basalt at site 006.

90-008: Coastal outcrop 1.8km south of Mosquito Cove. Fresh, hard, massive basalt having chlorite veins. Excellent site for concrete aggregate, rock would easily pass physical tests and a sample was collected for A.A.R. Rock type is similar to rock in site 007.

90-009: Coastal outcrop 1km south of Mosquito Cove. Fresh massive basalt having numerous chlorite and calcite veining; the outcrop is also highly fractured and jointed; sample taken for A.A.R.

90-010: Coastal outcrop at the south head of Mosquito Cove. The rock type is a Massive basalt, which is fresh and hard with only slight surface weathering at this site. The basalt is in contact with the lithic tuff. Site 010 seems to be the maximum extent of the basalt which was first observed at site 006 and extends along the coast to the present site.

90-011: Coastal outcrop near the head of Mosquito Cove. Lithic tuff similar to rock seem in sites 001, 002, 003, 004.

90-012: Coastal outcrop 0.7km north of Mosquito Cove. This rock type is reddish conglomerate/sandstone which is fresh and hard, and massive to wavy bedded.

90-013: Coastal outcrop 1.3 km north of Mosquito Cove. Greenish-grey alternating beds of fresh and hard sandstone and siltstone. This site has excellent potential for concrete aggregate. Sample taken for A.A.R.

90-014: Coastal outcrop 1.8km north of Mosquito Cove. At this site there is contact between the greenish/grey siltstone/sandstone and the red conglomerate.

90-015: Coastal outcrop 2.2km north of Mosquito Cove. Conglomerate having minor sandstone interbeds.

90-016: Coastal outcrop 2.0km south of Little Mosquito Cove. Conglomerate having minor sandstone interbeds, similar to site 015.

90-017: Coastal outcrop 1.1km south of Little Mosquito Cove. Conglomerate similar to sites 015, 016.

90-018: Coastal outcrop at the head of Little Mosquito Cove. Red Conglomerate in contact with greenish/grey sandstone/siltstone, similar to site 014.

90-019: Coastal outcrop on the north head of Little Mosquito Cove. Red conglomerate, similar to pervious sites.

90-020: Coastal outcrop 2.4km south of Stock Cove. There are three distinct in rock types at this site; basalt, rhyolite and tuff. The rocks are relatively hard and fresh.

90-021: Coastal outcrop 1.9km south of Stock Cove. Massive to altered basalt associated with debris flows and ash flow interbeds.

90-022: Coastal outcrop 1.4km south of Stock Cove. Flow banded rhyolite; rock is fresh and hard having numerous fractures and jointing.

90-023: Coastal outcrop 0.5km south of Stock Cove. Altered rhyolite having a distinctive schistosity. The rock is fresh and hard.

90-024: Coastal outcrop 0.5km south of Centre Bay. Flow banded rhyolite. Rock is fresh, hard, fractured and jointed.

90-025, 026

Coastal outcrop 0.1km south of Centre Bay. The geology is the same as site 90-024.

90-027: Coastal outcrop 2km south of Centre Bay. Flow banded rhyolite and debris flow.

90-028: Coastal outcrop 2.5km south of Centre Bay. The geology is the same as site 027.

90-029: Coastal outcrop 3km south of Centre Bay. The geology is the same as site 027.

90-030: Coastal outcrop 3.5km south of Centre Bay. Fresh debris flow, siltstone, sandstone and conglomerate.

90-031: Coastal outcrop 4km south of Centre Bay. Fresh and hard sandstone.

90-032: Coastal outcrop 4.5km south of Centre Bay. The rock type consists of alternating beds of sandstone/siltstone.

90-033: Coastal outcrop 3.5km north of Stanton Point. Fresh sandstone.

90-034: Coastal outcrop 2.9km north of Stanton Point. The rock type consists of alternating siltstone/sandstone having a slaty cleavage.

90-035: Coastal outcrop 1.5km north of Stanton Point. The geology is the same as site 90-034.

is red arkoseic sandstone.

90-037: Coastal outcrop at Stanton Point. The rock type is red arkoseic sandstone.

90-038: Coastal outcrop 1.1km south of Stanton Point. The rock type is red arkoseic sandstone.

Sites 90-039 to 90-057 are all located within the immediate area of Mosquito Cove and consist of tuff (sites 039, 040, 042, 045, 050, 055, 056) and basalt (sites 041, 043, 044, 046, 047, 048, 049, 051, 052, 053, 054, 057).

CONCLUSIONS

Based on rock type, degree of weathering, hardness and alteration, 19 of the 57 sites surveyed (07, 08, 09, 010, 013, 014, 039, 041, 043, 044, 046, 047, 048, 049, 051, 052, 053, 054, 057) show a high potential for concrete aggregate. However sites 041 to 056 were the result of detailed sampling in one large area of Mosquito Cove, which essentially mean that only 9 distinctive areas show high potential for concrete aggregate.

The complex geology of the area,and the numerous faults and alterations, makes it absolutely essential that detailed drilling be carried out in the area to substantiate the quantity and quality

of aggregate at each site.

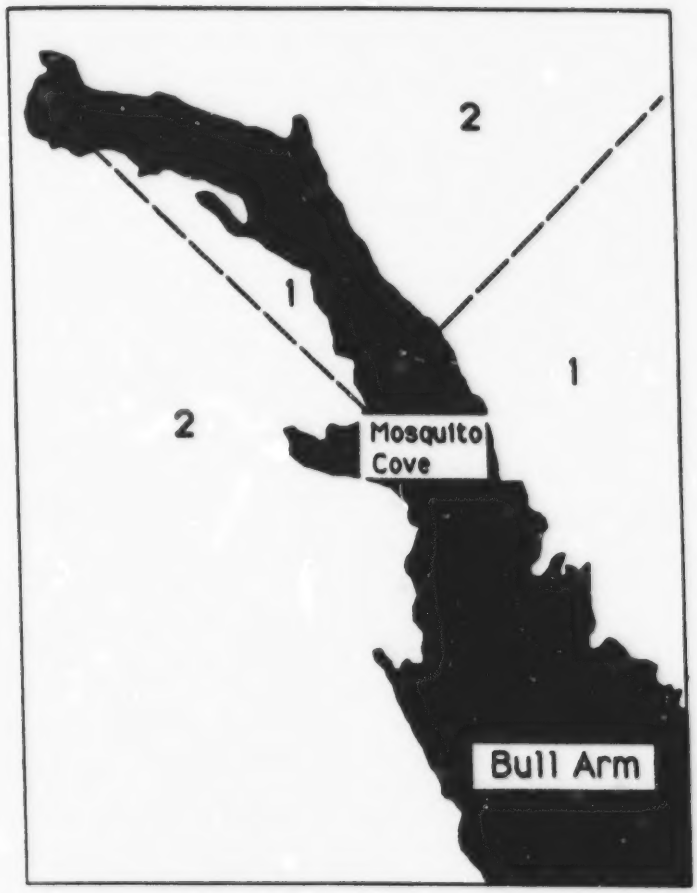

Figure 1: General geology of area.

1 - undivided sedimentary rock

2 - mafic and felsic volcanic rocks.

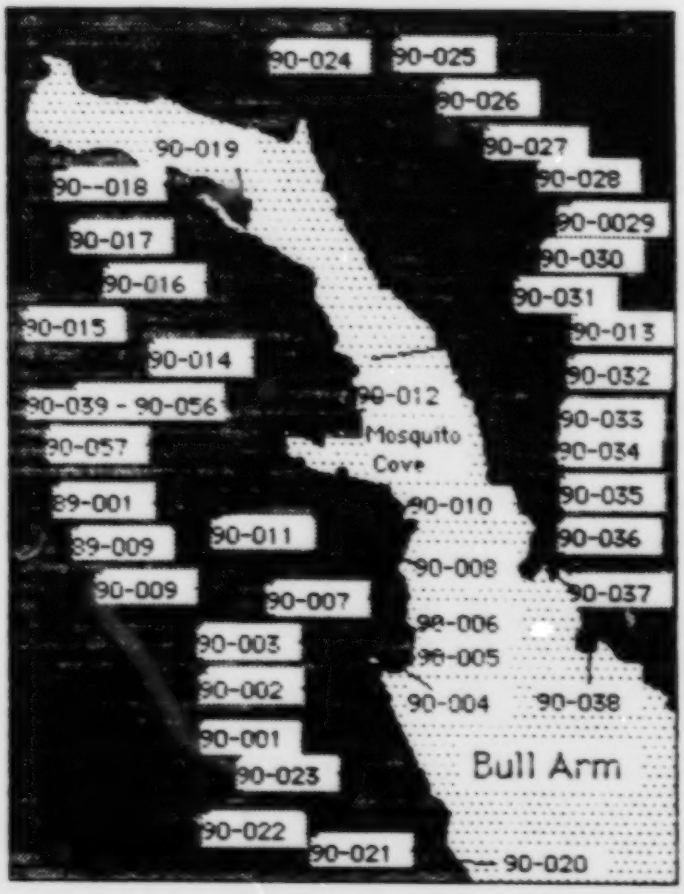

Figure 2 Site location map.

Results of Alkali-Aggregate reactivity testing on representative samples from the Bull Arm - Mosquito Cove area.

Site Number	Sample Number	% Exp'n	Comments	Rock Type
90-001	90-001	0.365	Reactive	Tuff
90-006	90-006	0.020	Non-reactive	Basalt
90-010	90-010	0.029	Non-reactive	Basalt
90-013	90-013	0.404	Reactive	Sandstone
90-025	90-024	0.078	Non-reactive	Rhyolite

Note: Expansion > 0.15% at 14 days is considered Deleterious and thus Alkali-reactive.